Conservation Assessment for Sticta fuliginosa (Hoffm.) Ach.

Photo: Stephen Sharnoff

USDA FOREST SERVICE, EASTERN REGION

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This Conservation Assessment was prepared to compile the published and unpublished information on the subject taxon or community; or this document was prepared by another organization and provides information to serve as a Conservation Assessment for the Eastern Region of the Forest Service. It does not represent a management decision by the U.S. Forest Service. Though the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the subject taxon, please contact the Eastern Region of the Forest Service - Threatened and Endangered Species Program at 310 Wisconsin Avenue, Suite 580 Milwaukee, Wisconsin 53203.

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EXECUTIVE SUMMARY

Sticta fuliginosa (Hoffm.) Ach. is designated as a Regional Forester Sensitive Species on the Superior National Forest in the Eastern Region of the Forest Service. The purpose of this document is to provide the background information necessary to prepare Conservation Approaches and a Conservation Strategy that will include management actions to conserve the species.

This conservation assessment provides available information on *Sticta fuliginosa* (Hoffm.) Ach. and its distribution, habitat, range, status, life history, and ecology. *Sticta fuliginosa* grows on mossy trees and rocks in moist places throughout the temperate parts of the world. In North America it is fairly common on the west coast and in the southern Appalachians. This species is listed as Endangered in Sweden but is not listed in other parts of Europe. In the Great Lakes area common habitat for this species is on old-growth yellow birch in swamps and bogs. It is an R9 Sensitive Species on Superior National Forest in Minnesota. Threats to *Sticta fuliginosa* are logging or road construction in or near the bogs where this grows. This species is also very sensitive to air pollution.

ACKNOWLEDGEMENTS

Appreciation is extended to the curators of the herbaria for help in obtaining label data for collections of rare lichens and to Dr. James Bennett for assistance. Regional USFS personnel also provided maps and assistance in obtaining data for their forests and are thanked for their help.

INTRODUCTION

For this document a search was made of the printed literature, Internet (W-1), and other literature thought to have pertinent information. Distribution and ecological information was gathered along with range-wide status and threats. All collections of the species found in the University of Michigan Herbarium (MICH), University of Minnesota Herbarium (MIN), Michigan State University Herbarium (MSC), and University of Wisconsin Herbarium (WIS) were located and the labels copied and entered into species databases. From these records ecological information, land ownership, and distribution maps were prepared for the area covered in this report. The draft reports were then sent to reviewers for comments and additions.

Most lichens do not have common names that are widely known, although some attempts have been made to create them (Brodo et al. 2001). For most species there is little known about the detailed ecology and the historical distributions of these lichens but some data could be derived from the herbarium collections.

NOMENCLATURE AND TAXONOMY

Family: Lobariaceae
Scientific name: *Sticta fuliginosa* (Hoffm.) Ach.
Common name: none
USDA plant code: STFU60
Synonyms: none

DESCRIPTION OF SPECIES

"Upper surface isidiate; thallus greenish to dark brown, thin, loosely attached, 5-10 cm broad; isidia usually clumped; lower surface tan, long tomentose, with conspicuous cyphellae; apothecia lacking" (Hale 1979).

The species is dark blackish gray when wet or occasionally brownish with similar colored isidia over the surface of the short lobes. The lower surface has white spots among the abundant tomentum. *Pseudocyphellaria crocata* has yellow spots on the lower surface and yellow soredia on the upper surface. Species of *Peltigera* that are similar color have no spots below. See color photo # 823 in Brodo et al. (2001) and McCune & Geiser (1997) p. 278.

LIFE HISTORY

Reproduction : This lichen produces asexual isidia that are larger that soredia. Apothecia are unknown in our area so reproduction by spores is not possible.

Ecology : This lichen usually grows on trees but there are some records on rock. It is found in very humid old-growth areas. It is also very sensitive to air pollution and can fix nitrogen (McCune & Geiser 1997).

Dispersal : Dispersal of this lichen is by isidia that can be carried by water or sometimes by wind to new substrates.

Obligate Associations : NA

HABITAT

Range-wide : This species is known from both Northern and Southern Hemispheres and occurs in Europe, Africa, South America, Australia, and New Zealand (Purvis et al. 1992). In the British Isles it grows on "mossy trees and damp rocks in humid, sheltered situations, in ancient, oceanic woodlands" (Purvis et al. 1992). In North America it occurs on mossy rock and bark (Brodo et al. 2001). In our Pacific Northwest it grows on bark or wood of hardwoods and occasionally on conifers but rarely on rock (McCune & Geiser 1997). In the Great Smoky Mountains National Park it is found on hardwoods above 4500 ft. (McDonald 2000). It has similar habitat requirements in our region but is more frequent on conifers.

National Forests : In Superior National Forest this is known only from old-growth forests where it was collected on hardwoods.

Site Specific : One site in Superior National Forest was in the center of an old- growth pine forest but the lichen was growing on a dead snag in the middle of a temporary pond. The other site was at the edge of a black ash-*Thuja* bog with the lichen on the base of an old yellow birch.

DISTRIBUTION AND ABUNDANCE

Range-wide Distribution : This world-wide species is known from South America, Central America, Australia, New Zealand, and Canada (McDonald 2000) and also China (Wei 1991) and

Europe (Poelt 1969) where it is mostly rare. In North America it is fairly common on the west coast from Alaska to California (McCune & Geiser 1997). It was reported as common in the southern Appalachians (Degelius 1941) but rare in New Brunswick, Canada (Gowan & Brodo 1988).

Region-wide Distribution : This species has been reported only from Michigan (Fryday et al. 2001) and Minnesota (see Appendix 1). In this region before 1970 it was known from eight localities, and after 1970 it has been collected at five additional localities.

Population Trends : Range-wide this species has decreased in many parts of Europe. In our region there seems to have been a drastic reduction in populations. This reduction is probably due to the extensive logging in the early 20th century.

RANGEWIDE STATUS

Listed as Endangered in Sweden (Thor 1999). Forestry practices and air pollution have caused its decline there. In North America it is still secure in the southern Appalachians and further north as well as in the Pacific Northwest. For definitions of ranks see Appendix 4.

U. S. Fish and Wildlife Rank:	Not ranked
Global Heritage Status Rank :	G3G5
U. S. National Heritage Rank :	N3N5
US Forest Service, R9 Sensitive Species:	Sensitive on Superior National Forest. See Appendix 2.
Michigan Rank :	S?
Minnesota Rank :	Special Concern
Wisconsin Rank :	Not ranked
Ontario, Canada Rank :	Not ranked

The decrease of *Sticta fuliginosa* in our region is due to logging of the old-growth forests. In other parts of its range both forestry practices and air pollution are factors in its decrease.

POPULATION BIOLOGY AND VIABILITY

This reproduces asexually by isidia and requires humid shady habitats in old-growth forests. Because the algae are cyanobacteria the lichen can fix nitrogen and is very sensitive to air pollution. The isidia can be dispersed a moderate distance but need a suitable habitat to survive. This species is viable in the southern Appalachians and the Pacific Northwest. In our region the great decrease in known populations may indicate a decrease in viability here.

POTENTIAL THREATS

There is little information on its range-wide population trend. In our area this species was more abundant in the past before the extensive logging. It cannot disperse far because it disperses by vegetative isidia and requires numerous suitable habitats not widely spaced. Any disturbance of the old-growth humid forests are a threat to its survival.

Present or Threatened Risks to Habitat :	The necessity for old-growth, moist habitats indicates that logging and road construction near this lichen could be a threat. It is also very sensitive to air pollution because the blue green algae in the thallus are killed by even low levels of sulfur dioxide.
Overutilization :	NA
Disease or Predation :	NA
Inadequacy of Existing Regulatory Mechanisms :	Michigan and Wisconsin do not have official lists of protected lichens and are not monitoring them.
Other Natural or Human Factors :	Major fires, blowdowns, and climate warming could eliminate this species by lowering the humidity.

SUMMARY OF LAND OWNERSHIP AND EXISTING HABITAT PROTECTION

Of the 13 known localities of this species 8 are in areas under state or federal ownership. See data base table for known localities in Appendix 3.

RESEARCH AND MONITORING

Existing Surveys, Monitoring, and Research : A survey was made in Superior National Forest in 1999 to look for localities with rare lichens (Wetmore 2000) . This species was found at one new locality during this survey. In addition two pre-timber sales surveys have been made to look for rare species but this species was not found.

Survey Protocol : For the 1999 survey likely sites were chosen using USFS vegetation maps followed by low-level aerial flights to look for likely habitats. Ground checking was then done and total collections were made at interesting localities. In addition two pre-timber sales surveys have been made to look for rare species but this species was not found.

For the pre-timber sales surveys a lichenologist walked through parts of the sales area looking for rare lichens.

Research Priorities : The northern part of our region should be searched for new localities of this species. Relocation of the historical populations and study of the detailed ecology would help to understand the habitats it requires.

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INTERNET SOURCES

W-1 Recent Literature on Lichens - http://www.toyen.uio.no/botanisk/bot-mus/lav/sok_rll.htm

W-2 Plant name database: http://plants.usda.gov/cgi_bin/topics.cgi

LIST OF CONTACTS

Information Requests:
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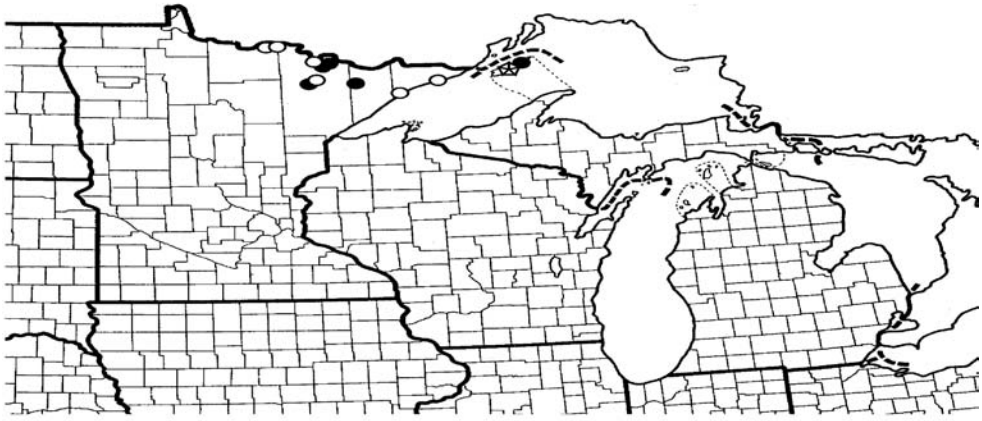
APPENDICES

APPENDIX 1 Distribution of *Sticta fuliginosa*



Sticta fuliginosa

☆ = MICH herbarium specimens before 1970
★ = MICH herbarium specimens after 1970
○ = MIN herbarium specimens before 1970
● = MIN herbarium specimens after 1970
⛤ = MSC herbarium specimens before 1970
⬟ = MSC herbarium specimens after 1970
□ = WIS herbarium specimens before 1970
■ = WIS herbarium specimens after 1970

APPENDIX 2 Lichens of conservation concern on the Lakes States National Forests

Scientific Name	CN	CP	HI	HM	OT	SU
Arctoparmelia centrifuga						(X)
Caloplaca parvula						X
Cetraria aurescens			(X)	(X)	(X)	X
Cetraria oakesiana			(X)	(X)	(X)	X
Cladonia wainioi						X
Lobaria quercizans	(X)		(X)	(X)	(X)	X
Peltigera venosa						X
Pseudocyphellaria crocata						X
Ramalina thrausta						(X)
Sticta fuliginosa						**X**
Usnea longissima					(X)	X

X = present in the forest and listed as sensitive
(X)= present in the forest but not listed as sensitive

National Forest Codes
CN Chequamegon/Nicolet
CP Chippewa
HI Hiawatha

HM Huron/Manistee
OT Ottawa
SU Superior

APPENDIX 3 Locality data of *Sticta fuliginosa*

Area	*State*	*County*	*Locality*	*Year*
MN	St. Louis	Tower	1901	
MN	St. Louis	Harding	1901	
MN	Koochiching	Koochiching	1901	
MN	Cook	Tofte	1897	
MN	Cook	Grand Marais	1902	
Isle Royale NP	MI	Keweenaw	Hay Bay	1958
Isle Royale NP	MI	Keweenaw	Moskey Basin, NE side	1983
Superior NF	MN	St. Louis	North of Pfeifer Lake	1999
Superior NF	MN	Lake	Kiwishiwi Pines N Sect. of SNA	1994
Voyageurs NP	MN	St. Louis	Namakan Narrows, W of	1978
Voyageurs NP	MN	St. Louis	Kettle Falls	1901
Voyageurs NP	MN	St. Louis	Daley Brook Swamp	1978
Voyageurs NP	MN	Koochiching	Rainy Lake City	1901
Count = :	13			

APPENDIX 4 Definitions of Ranks

Definitions of Global Heritage Ranks

G3: Vulnerable—Vulnerable globally either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extinction or elimination. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.

G4: Apparently Secure—Uncommon but not rare (although it may be rare in parts of its range, particularly on the periphery), and usually widespread. Apparently not vulnerable in most of its range, but possibly cause for long-term concern. Typically more than 100 occurrences and more than 10,000 individuals.

G5: Secure—Common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Not vulnerable in most of its range. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

Definitions of National and Subnational Heritage Ranks

N2 , S2: Imperiled—Imperiled in the nation or subnation because of rarity or because of some factor(s) making it very vulnerable to extirpation from the nation or subnation. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000).

N3, S3: Vulnerable—Vulnerable in the nation or subnation either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.

N4, S4: Apparently Secure—Uncommon but not rare, and usually widespread in the nation or subnation. Possible cause of long-term concern. Usually more than 100 occurrences and more than 10,000 individuals.

N5, S5: Secure—Common, widespread, and abundant in the nation or subnation. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

N?, S?: Unranked—Nation or subnation rank not yet assessed.

Minnesota Ranks

Endangered: A species is considered endangered if the species is threatened with extinction throughout all or a significant portion of its range within Minnesota.

Threatened: A species is considered threatened if the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range within Minnesota.

Special Concern: A species is considered a species of special concern if, although the species is not endangered or threatened, it is extremely uncommon in Minnesota, or has unique or highly specific habitat requirements and deserves careful monitoring of its status. Species on the periphery of their range that are not listed as threatened may be included in this category along with those species that were once threatened or endangered but now have increasing or protected, stable populations.

Regional USDA Forest Service Ranks (USDA Forest Service. 1995. Forest Service Manual 2670.5. Washington, D.C.)

Sensitive Species: Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by:

a. Significant current or predicted downward trends in population numbers or density.

b. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.